[0054] Once the insulative skeletal frame 121 is applied to the terminal lead frame, the transverse connecting ~~pieces~~ strips 114 may be singulated (i.e., removed) to electrically isolate individual terminals from each other. The resulting structure defines a terminal assembly 130 as shown in the center portion of FIG. 2. This assembly 130 is then inserted into an exterior housing 140 that is formed from two opposing and inter-engaging halves 141, 142 that cooperate to form the exterior housing 140 that takes the form of a thin wafer 145.

[0055] The wafer 145 has a plurality of sides, or edges, 146-151. Two of these edges 146, 147 are adjacent each other and respectively define the mating and mounting edges of the wafer 145.

[0056] Each of the housing halves 141, 142 is provided as shown, with a series of grooves, or recesses 155 that are separated from each other by a series of intervening walls 156. These grooves 155 define channels 158, each of which receives a single terminal extent of the terminal assembly 130. In an important aspect of the present invention, substantially all, and preferably all of the exposed surfaces 160, 161 are covered with a conductive material such as a metal. This covering is best achieved by the plating of the housing halves 141, 142 or otherwise depositing a conductive material thereon. Due to this conductive plating, the entire wafer housing 140 acts as an exterior ground to the inner signal terminals 104, throughout the extent of the wafer housing 140 from its mounting edge 147 to its mating edge 146. As seen in FIGS. 3 and 4 where the mating portions 110 of the terminals 104 have been removed for clarity, the terminal 104 is partially encompassed by its insulative support ~~130~~ 120 which in turn is encompassed by the exterior conductive wafer housing. The exterior wafer housings are connected to ground on a circuit board 200 (FIG. 6) so as to electrically ground the entire wafer housing 140.

[0057] As set forth above, the structure of the present invention gives a coaxial nature to each terminal of the assemblies. This coaxial nature may be shown best in FIG. 8A, where it can be seen that each conductive terminal 104 has an insulative skeletal framework 121 applied to it. This framework is bifurcated in some areas, where distinct top and bottom portions 121a, 121b thereof are separated by the slots 128 that expose the outer surfaces of the terminals 104 to air. The top and bottom

portions 121a, 121b provide an insulator that partially covers the terminal 104, in a manner similar to inner insulation found in a coaxial cable. A normal coaxial cable then has its insulating layer surrounded by a conductive shield, which is usually formed from a braided wire.

[0058] In the structure of the present invention, such a shield is formed by plating the exterior wafer housing 140 with a conductive material. The exterior housing has two halves 141 and 142, with recesses formed therein that receive the terminal-framework as shown in FIG. 8A. An air gap ~~191~~ 190 may or may not be provided between the housing halves 141, 142 and the top and bottom portion of the skeletal framework 121a, 121b. The inner edges of the housing halves may abut each other, or they may be separated by an intervening gap which will largely be controlled by manufacturing tolerances. As mentioned elsewhere in this description, engagement members are formed on the housing halves 141, 142 to provided effective electrical contact between the two halves 141, 142 so that the entire housing 140 may act as a single ground for all of the terminals 104 contained therein.

[0059] FIGS. 3 and 4 are sectioned through the wafer housing 140 and terminal assembly 130 along line **3-3** in FIG. 2 and best show one manner in which the terminal assembly 130 engages the wafer housing halves 141, 142. The housing halves 141, 142 are provided with openings 170 into which engagement lugs 172 that are formed on the terminal assembly 130. These lugs 172 preferably have blunt, enlarged heads 174 that have a dimension larger than that of the openings 170 for retention purposes. The engagement between the lugs 172 and the housing openings 170 may be a press-fit style of engagement, or a heat staked engagement or any other suitable engagement.

[0060] The rear edge 148 of the wafer housing 140 may include a slot 180 that serves to engage an alignment bar 181 that is mounted on a circuit board 200 and which serves to align the rear of the wafer housings 140 together as a unit, or block of wafer housings. (FIG. 6.) A cover member 210 in the form of a hollow, square shroud 212 may be provided to protect and to align the terminal mating portions 110 and the front edges 146 of the wafer housings 140. The cover member may include slots 214 that are separated by intervening walls 215. These slots 214 receive the bottom and top

when the wafers are assembled together as a unit as shown in FIG. 7. This ground structure 330 has a plurality of walls 350 that extend up from the base wall 335. These walls 350 are received within corresponding opposing slots 329 that are formed in the insulative shell member 320 and the slots serve to at least partially define separate housings for each terminal of the receptacle connector.

[0065] It can be seen that both of the connector components provide a pseudo-coaxial structure in which conductive terminals and first surrounded by an insulative support or shell and then are encompassed by conductive grounds. In this manner the reference ground is maintained in proximity to the inner terminals through the mating interface of the two connector components and through the connector components to the circuit boards to which they are mounted, thus providing for better signal isolation and higher transmission speeds.

[0066] FIG. 19 illustrates an alternate embodiment of a wafer housing structure 400 . In this embodiment, one wafer housing half 401 is molded over a set of conductive terminals 402. This housing half is formed from a dielectric material. A second housing half 403 is molded and is plated or otherwise covered with a conductive material. This conductive material gives it the properties of a grounding shield. The two housing halves 401, 403 are formed with alternating and interfitting valleys and lands which interfit with each other in the manner shown in FIG. 19.

[0067] In another aspect of the present invention, the connectors are provided with a unique tail structure. As shown generally in FIGS. 4 & 5, the tail portions 108 of the terminals ~~102~~ 104 have a blunt body portion 130 that extends generally transversely to the axes of the terminals 102, and in this case, generally parallel to the plane of the surface of a circuit board to which it is mounted. A mounting stub 131 is provided that projects from the body portion 130 and is shown projecting downwardly in FIG. 5. The tail 108 may be considered as having a pair of re-entrant portions, or notches 132. This stub portion enters a mass of solder paste 133 that is deposited on contact pads of a circuit board 134 as shown best in FIG. 22, and the re-entrant portions 132 promote the wicking, or movement of the solder paste 133 up and around the terminal tail body portion 130 to thereby establish a reliable solder joint.

[0068] The ground structure 140 has similar surface mounting tails 229 formed as

I claim:

1. A high-density connector assembly comprising :

a plurality of individual terminal assemblies, each terminal assembly having a plurality of signal terminal disposed therein in a signal terminal array;

each of the signal terminals including a contact portion for mating with an opposing connector, a tail portion for connecting to a circuit board and a body portion interconnecting the contact and tail portions together, the terminal body portions being supported within an insulative frame; and,

a conductive ground structure that encompasses said signal terminals and which supports the frame, the ground structure including at least a pair of interengaging housing halves having a plurality of grooves formed in opposing faces thereof, the grooves supporting said frame in place between said housing halves such that each of the grooves receives a single terminal therein.

2. The connector assembly of claim 1, wherein said frame is molded over portions of each of said terminals.

3. The connector assembly of claim 2, wherein said frame includes slots formed longitudinally therein arranged along axes of at least some of said terminals exposing portions of said terminals to air.

4. The connector assembly of claim 3, wherein said ground structure housing halves include interior face portions that oppose each other and surround said frame, the interior face portions being plated with a conductive material.

5. The connector assembly of claim 4, wherein said ground structure grooves are sized to provide an air gap between said frame and said ground structure housing halves.

6. The connector assembly of claim 3, wherein said ground structure includes means for holding said ground structure housing halves together as a single

a conductive ground structure that encompasses said signal terminals and which supports the frame, the ground structure including at least a pair of interengaging housing halves having said frame and terminals in place therebetween, the ground structure including a plurality of surface mount tail portions arranged along opposing edges of a mounting face of said ground structure, the ground structure surface mount tail portions also including having wide body portions and narrow contact portions extending therefrom, the difference in size between said narrow contact portions and the wide body portions promoting wicking of solder onto the ground structure surface mount tail portions.

19. The connector of claim 18, wherein said ground structure further includes a plurality of recesses disposed along opposing edges of the ground structure mounting face and interposed between said ground structure surface mount tail portions.

20. The connector of claim 19, wherein the recesses of one ground structure receive said tail portions of an adjacent ground structure when said ground structure and adjacent ground structure are mounted to a circuit board.